

DATSAV2 UPPER-AIR DATABASE USER'S HANDBOOK

By
Melvin I. Smith
Meteorologist



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Air Force Combat Climatology Center
Operating Location-A
Upper Air Section
Federal Building
Asheville, NC 28801-2723

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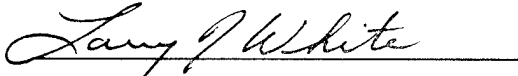
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LARRY J. WHITE, Maj, USAF
Chief, Systems Division

FOR THE COMMANDER



JAMES S. PERKINS
Scientific and Technical Information
Program Manager
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PREFACE

AFCCC/UH—96/001 provides users of the DATSAV2 Upper-Air Database a description of the database, specific information on the database format, and an overview of the processing and quality control used in building the database. The DATSAV2 Upper-Air Database is comprised of upper-air observations collected worldwide since January 1989, and includes data from radiosonde and rawinsonde (RAOB), pilot balloon (PIBAL), rocketsonde (ROCOB), dropsonde (DROP), Significant Level Abbreviated Messages (SLAM), and Geostationary Operational Environmental Satellite (GOES) wind observations.

CONTENTS

CHAPTER 1. INTRODUCTION	1
1.1 Purpose	1
1.2 Background	1
1.3 Questions and Comments	1
CHAPTER 2. DESCRIPTION OF DATSAV2 UPPER-AIR DATABASE	3
2.1 Database Construction	3
2.2 Database Format Introduction	3
2.3 Database Formats	3
CHAPTER 3. OL-A, AFCCC DATA PROCESSING & QUALITY CONTROL	5
3.1 Processing	5
3.2 Quality Control	5
CHAPTER 4. CONTROL FORMATS	7
4.1 Control Section for all Data	7
4.2 Control Section for RAOB Report	11
4.3 Control Section for PIBAL Report	12
4.4 Control Section for ROCOB Report	13
CHAPTER 5. DATA FORMATS	15
5.1 RAOB Report Level Data Section	15
5.2 RAOB Report Additional Data Section	17
5.3 RAOB Report Remarks Data Section	22
5.4 PIBAL Report Level Data Section	24
5.5 PIBAL Report Additional Data Section	25
5.6 PIBAL Report Remarks Data Section	27
5.7 ROCOB Report Level Data Section	28
5.8 ROCOB Report Remarks Data Section	30
APPENDIX A. AFGWC Regions	32
APPENDIX B. Marsden Squares	37
APPENDIX C. WMC Code Tables	39
APPENDIX D. Data Type Indicators	50
APPENDIX E. Validation Flags	51
APPENDIX F. Rejected Data Section	53

Chapter 1

INTRODUCTION

1.1 Purpose. The purpose of the DATSAV2 Upper-Air Database User's Guide is to provide the user with a general description of the DATSAV2 Upper-Air Database, to list specific information concerning the format used to store data in the DATSAV2 Upper-Air Database, and to give a brief description of the processing and quality control used in building the DATSAV2 Upper-Air Database.

1.2 Background. The DATSAV2 Upper-Air Database is the climatological database for all worldwide upper-air observations collected since January 1989 via the Automated Weather Network (AWN), the Global Telecommunications System (GTS), and other sources. These observations are decoded and validated at the Air Force Global Weather Central (AFGWC), Offutt AFB, Neb., and processed into the climatic database by the Operating Location A (OL-A), Air Force Combat Climatology Center, Asheville, N.C. The database is used for climatological applications by AFCCC (Scott AFB, Ill.) and OL-A, as well as other Department of Defense (DoD) and civilian customers.

DATSAV2 refers to the digital tape format in which validated upper-air weather observations are stored at OL-A. From January 1973 until the inception of DATSAV2, data is stored in a different format called DATSAV (see USAFETAC/TN—77-2). The DATSAV format will be converted to DATSAV2 in the future.

The DATSAV2 format offers two major improvements when compared to the original DATSAV format:

- DATSAV2 format conforms to Federal Information Processing Standards (FIPS).
- Expanded DATSAV2 format accommodates additional quality control flags and non-decoded data that were unavailable in DATSAV.

The DATSAV2 Database contains RAOB, PIBAL, ROCOB, DROP, SLAM, and GOES wind observational data. To fully describe the method of data collection for all of these observations would require a lengthy discussion of both the GTS, operated by the World Meteorological Organization (WMO), and the AWN, which is operated by the DoD. For our purposes, GTS data is collected worldwide and sent via the National Weather Service (NWS) to Det 7, AFGWC located at Tinker AFB, Okla. Data disseminated by various countries over Radio Teletype Transmission (RATT) and Continuous Wave (CW) broadcasts is collected by various overseas AWN sites and also sent to Det. 7, AFGWC. This data, along with any other data collected by Det. 7, AFGWC is then transmitted to AFGWC where it is used for operational requirements.

Each specific type of observation is decoded at AFGWC, processed through the upper-air validator to check for meteorological soundness, and then forwarded to OL-A on a near-real-time basis via a communications link. All daily receipt data is merged into station-date-time order and block-station numbers are validated against the Master Station Catalog (MSC). The daily sorted tapes are eventually sorted further into monthly and yearly files. OL-A, AFCCC also applies several quality control procedures to the data before final archiving and forwarding to AFCCC for DoD climatic applications.

1.3 Questions and Comments. Address questions or comments on the DATSAV2 Upper-Air Database to OL-A, 151 Patton Ave Rm 120, Federal Building, Asheville, N.C. 28801 (DSN 266-3100, Commercial 704/271-4256).

Chapter 2

DESCRIPTION OF DATSAV2 UPPER-AIR DATABASE

2.1 Database Construction Data records are written to magnetic tape adhering to ANSI Standard X3.27-1978. A Record Control Word (RCW) (consisting of four characters) precedes each record. The length of the logical record plus the length of the RCW is expressed as a decimal numeral in the RCW. For further description, the user should consult ANSI STD X3.27-1978.

The DATSAV2 Upper-Air Database consists of blocked, variable-length records in 8-bit ASCII character format. The maximum length of a data record is 9,992 bytes and the maximum block length is 9,996 bytes. The data is recorded on cartridge tape. Sequence of the data is BLOCK STATION - YEAR - MONTH - DAY - HOUR - MINUTE - LATITUDE - LONGITUDE - TYPE REPORT - OBSERVATION TYPE.

2.2 Database Format Introduction. Data for each observation consists of up to four sections: control, mandatory, additional, and remarks. Data for all observations have control and mandatory sections, while only some observations have additional and remarks sections. The format is flexible in design with

reserved fields in both the control and mandatory sections. This will allow for the inclusion of additional data in the future, without having to change the record or block length. The remarks section varies in length so that all available data can be included. The following general comments apply to the DATSAV2 Upper-Air format:

- A. Each field is 8-bit ASCII character format.
- B. Reserved fields are designated by "RES" and are coded as ASCII character "9s."
- C. Analysts must avoid trying to obtain more accuracy from the data than was originally observed. They must be familiar with the original reporting units of the elements being used.

2.3 Database Formats. The actual database formats are listed in Sections 4 and 5. Section 4 contains the control fields used at the beginning of each data set. Section 5 contains the data section formats for all the different reports (RAOB, PIBAL, ROCOB, etc ...).

Chapter 3

OL-A, AFCCC DATA PROCESSING AND QUALITY CONTROL

3.1 Processing. Processing of the DATSAV2 Upper-Air Database at OL-A, AFCCC consists of the following:

- A. Checking the readability and performing an inventory of the incoming data.
- B. Processing the data through quality control programs.
- C. Processing the data through a series of merge programs to produce a monthly file and then a yearly file.

The current month's data is maintained until all days for the month have been received. Then the data's merged into a monthly file. The current year's data is

maintained on a series of monthly tapes until all months of the year have been received and then the data's merged into a yearly file.

3.2 Quality Control. All incoming upper-air data received at AFGWC is processed through the upper-air validator. The validator checks the data for "impossible" meteorological values, and performs hydrostatic, lapse rate and wind shear checks to assure the meteorological quality and soundness of the data. "Flags" within the level data section indicate exactly which element values (pressure, height, temperature, wind direction, wind speed, dew point, or density) were flagged as suspect or failed by the validation process.

Chapter 4

CONTROL FORMATS

4.1 Control Section for all Data.

FIELD NO.	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13
	TOT	LVL	ADD	REM									
DATA	WORD	WORD	WRD	WRD									
FIELD	CNT	CNT	CNT	CNT	RES	STNUM	YEAR	MO	DA	HR	MN	LAT	LONG
# CHARS	XXXX	XXXX	XX	XXX	XXX	XXXXXX	XXXX	XX	XX	XX	XX	SXXXX	SXXXXX
CHAR LOC	1-4	5-8	9-11	14-	17-22	23-	27-	29-	31-	33-	35-39	40-45	

FIELD NO.	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25
											RAOB	PIBAL
DATA	TYP	OB				GWC	MARS			CALL	INST	EQUIP
FIELD	REP	TYP	OPT	RES	ELEV	REG	SQR	ULA	ULO	LTRS	TYPE	TYPE
# CHARS	X	X	X	XX	SXXXX	XX	XXX	XX	XX	XXXX	XX	X
CHAR LOC	46	47	48	49-	51-55	56-	58-60	61-	63-	65-	69-	71

FIELD NO.	C26	C27	C28	C29	C30	C31	C32	C33	C34	C35	C36
	TEMP	REL	HGT			OB	NUM	NUM	NUM		COR
DATA	WIND	LAUNCH	DENS	OLA	QC	DAT	ADD	REM		SRC	OBS
FIELD	UNITS	TIME	FLAG	QC	IND	LVL	GRP	GRP	RES	IND	IND
# CHARS	X	XXXX	X	XXXX	XXX	XXX	XX	XX	XX	X	XX
CHAR LOC	72	73-76	77	78-	82-	85-	88-	90-	92-	94	95-

FIELD NO.	C37
	KIND OF REPORT
DATA	BY OB TYPE-
FIELD	DESCRIBED BELOW
# CHARS	XXXXXXXXXXXXXXXXXXXX
CHAR LOC	97 - 112

KIND OF REPORT (RAOB)

FIELD NO.	C371	C372	C373	C374	C375	C376	C377	C378	C379
						SFC			
DATA									
FIELD	RT1	RT2	RES	RT3	VAL	RES	RES	RES	RES
# CHARS	XX	XX	X	XX	X	XX	X	XX	XXX
CHAR LOC	97-	99-	101	102-	104	105-	107	108-	110-

KIND OF REPORT (PIBAL)

FIELD NO.	C371	C372	C373	C374	C375	C376	C377	C378	C379
						SFC			
DATA									
FIELD	PT1	PT2	RES	PT3	VAL	RES	RES	RES	RES
# CHARS	XX	XX	X	XX	X	XX	X	XX	XXX
CHAR LOC	97-	99-	101	102-	104	105-	107	108-	110-

KIND OF REPORT (ROCOB)

FIELD NO.	C371	C372	C373	C374	C375	C376	C377	C378	C379
DATA									
FIELD	NRI	TSI	TCI	TDI	RMI	WEI	WCI	WRI	RES
# CHARS	XX	XX	X	XX	X	XX	X	XX	XXX
CHAR LOC	97-	99-	101	102-	104	105-	107	108-	110-

CHAPTER 4

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
C01	TOT WORD CNT. Total word count of record (0000-9999)
C02	LVL WORD CNT. Level Data Section Word Count (0000-9999)
C03	ADD WRD CNT. Additional Data Section Word Count (00-99)
C04	REM WRD CNT. Remark Section Word Count (000-999)
C05	RES. Reserved, coded as 999.
C06	STNUM. Block-Station Number (000000-999998). Non-permanent (roving) ships are coded as '999999'; GOES reports are coded as '000000-999999'; Dropsondes are '000000'. Land reports with no WMO numbers are coded as '000000'.
C07	YEAR. Year (0000-9999)
C08	MO. Month of the year (01-12)
C09	DA. Day of the Month (01-31)
C10	HR. Hour of the Day (00-23)
C11	MN. Minute of the Hour (00-59)
C12	LAT. Latitude in degrees and minutes (-9000 to +9000). South latitudes are negative. Missing coded as +9999.
C13	LONG. Longitude in degrees and minutes (-18000 to +18000). East longitudes are negative. Missing coded as +99999.
C14	TYP REP. Type Report as follows: 0,2,3,5,6,8 = RESERVED 1 = UPPER AIR CORRECTED REPORT 4 = UPPER AIR NOID REPORT 7 = UPPER AIR 9 = MISSING
C15	OB TYP. Observation Type as follows: 1 = ROCOB 2 = PIBAL 4 = RAOB 9 = MISSING
C16	OPT. Option Code as follows: 0 = SATELLITE WINDS 1 = BLOCK-STATION REPORTS (LAND, WMO NUMBERED) 2 = PERMANENT SHIP REPORTS 3 = NO-NAME SHIP REPORTS (ROVING) 4 = NAME SHIP REPORTS (ROVING) 5 = LAND STATION; CALL LETTERS ONLY 6 = DROPSONDE REPORTS 7 = SATELLITE VTPR 8 = AIRCRAFT FLIGHT LEVEL REPORTS 9 = MISSING

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
C17	RES. Reserved, coded as 99
C18	ELEV. Elevation of station in whole meters (-9999 to +9998). When elevation = 0, assume +. Missing coded as +9999.
C19	GWC REG. AFGWC Region Number (01-80). Missing coded as 99 (see APPENDIX A).
C20	MARS SQR. Marsden Square (001-936) according to WMO Code 2590. Missing coded as 999 (see APPENDIX B).
C21	ULA. Units digit of latitude (00-99) (see APPENDIX B).
C22	ULO. Units digit of longitude (00-99) (see APPENDIX B).
C23	CALL LTRS. WMO Station Call Letters in ASCII Characters. For GOES reports, coded as 'GOES'; for Dropsondes, coded the aircraft tail number is last 3 digits. Missing coded as 4 ASCII blanks, ' ' ' '.
C24	RAOB INST TYPE. AFGWC RAOB Instrument type (01-25) as based on the Air Weather Service Master Station Catalog (see APPENDIX C). Missing coded as 99.
C25	PIBAL EQUIP TYPE. PIBAL Wind Equipment Type (0-8) according to WMO Code 0265. Missing coded as 9 (see APPENDIX C).
C26	TEMP/WIND UNITS. Temperature/Wind Reported Units as follows: <ul style="list-style-type: none"> 0 = Fahrenheit/Knots 1 = Celsius/Knots 2 = Celsius/Meters per second 9 = Missing
C27	REL LAUNCH TIME. Release or Launch Time for RAOB/PIBALs. Firing time for ROCOBs (0000-2359) in HHMM format. Missing coded as 9999.
C28	Hgt & Dens FLAG. Height and Density flags (0-3,9) (Used internally by AFGWC) <ul style="list-style-type: none"> 0 = Neither flag set 1 = Density flag set 2 = Height flag set 3 = Density & Height flags set 9 = Missing
C29	OLA QC. For OL-A quality control purposes (0000-9999)

CHAPTER 4

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>																																						
C30	OB QC IND. Observation Quality Indicator (000-100) as follows: 100 = Passed all checks 0 = Failed every check -99 = Quality Indicator missing $OQI = (((\text{Sum of actual failures}) * (\text{Fail weight})) + (\text{Sum of actual suspects})) * 100 / \text{Sum of all reported values} * \text{Failed weight. (Computed by AFGWC)}$																																						
C31	NUM DATA LVL. Number data levels (001-999).																																						
C32	NUM ADD GRP. Number of Additional Data Groups (00-99).																																						
C33	NUM REM GRP. Number of Remarks Groups (00-99).																																						
C34	RES. Reserved, coded as 99.																																						
C35	SRC IND. A Source Indicator to stipulate original source of data (0-7,9): 0 = DATSAV Upper Air 1 = WDC-A Rocketsonde 2 = OL-A's TDF52 3 = OL-A's TDF53 4 = OL-A's TDF54 5 = OL-A's TDF56 6 = OL-A's TDF57 7 = NCDC's TDF63 8 = Not Used 9 = Missing																																						
C36	COR OBS IND. An Indicator to identify corrected observations (01-17,99). This indicator can be used in conjunction with C15 to show what part of an observation was corrected.																																						
	<table> <tr> <th>FIELD VALUE</th><th>TYPE OF CORRECTION</th></tr> <tr><td>01</td><td>A</td></tr> <tr><td>02</td><td>B</td></tr> <tr><td>03</td><td>C</td></tr> <tr><td>04</td><td>D</td></tr> <tr><td>05</td><td>AB</td></tr> <tr><td>06</td><td>AC</td></tr> <tr><td>07</td><td>AD</td></tr> <tr><td>08</td><td>BC</td></tr> <tr><td>09</td><td>BD</td></tr> <tr><td>10</td><td>CD</td></tr> <tr><td>11</td><td>ABC</td></tr> <tr><td>12</td><td>ABD</td></tr> <tr><td>13</td><td>ACD</td></tr> <tr><td>14</td><td>BCD</td></tr> <tr><td>15</td><td>ABCD</td></tr> <tr><td>16</td><td>SLAM</td></tr> <tr><td>17</td><td>ROCOB</td></tr> <tr><td>99</td><td>MISSING</td></tr> </table>	FIELD VALUE	TYPE OF CORRECTION	01	A	02	B	03	C	04	D	05	AB	06	AC	07	AD	08	BC	09	BD	10	CD	11	ABC	12	ABD	13	ACD	14	BCD	15	ABCD	16	SLAM	17	ROCOB	99	MISSING
FIELD VALUE	TYPE OF CORRECTION																																						
01	A																																						
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05	AB																																						
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07	AD																																						
08	BC																																						
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10	CD																																						
11	ABC																																						
12	ABD																																						
13	ACD																																						
14	BCD																																						
15	ABCD																																						
16	SLAM																																						
17	ROCOB																																						
99	MISSING																																						

4.2 Control Section for RAOB Report.

FIELD C37 - KIND OF REPORT (RAOB)	
<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
C371	RT1. DATA SOURCE FLAG1 00 = NONE OF THIS SET 01 = RAOB PART C 02 = RAOB PART B 03 = RAOB PARTS B & C 04 = RAOB PART A 05 = RAOB PARTS A & C 06 = RAOB PARTS A & B 07 = RAOB PARTS A, B & C 99 = MISSING
C372	RT2. DATA SOURCE FLAG2 00 = NONE OF THIS SET 01 = DROPSONDE PART B 02 = DROPSONDE PART A 03 = DROPSONDE PARTS A & B 04 = RAOB PART D 05 = RAOB PART D AND DROPSONDE PART B 06 = RAOB PART D AND DROPSONDE PART A 07 = RAOB PART D AND DROPSONDE PARTS A & B 99 = MISSING
C373	RES. Reserved, coded as 9.
C374	RT3. DATA SOURCE FLAG3 00 = NONE OF THIS SET 01 = RESERVED 02 = SATELLITE (GOES, ATS, ETC.,) 03 = RESERVED 04 = SLAM 05 = RESERVED 06 = SLAM & SATELLITE VTPR 07 = RESERVED 99 = MISSING
C375	SFC VAL. Surface level validity. Following indicates the validity of the surface level data: 0 = Surface data passed validation 1 = Surface Pressure and/or Temperature invalidated, but remainder of sounding is hydrostatically consistent. 4 = Surface Pressure invalidated only. 9 = missing
C376	RES. Reserved, coded as 99.
C377	RES. Reserved, coded as 9.
C378	RES. Reserved, coded as 99.
C379	RES. Reserved, coded as 999.

CHAPTER 4

4.3 Control Section for PIBAL Report.

FIELD C37 - KIND OF REPORT (PIBAL)

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
C371	PT1. DATA SOURCE FLAG1 00 = NONE OF THIS SET 01 = PIBAL PART C 02 = PIBAL PART B 03 = PIBAL PARTS B & C 04 = PIBAL PART A 05 = PIBAL PARTS A & C 06 = PIBAL PARTS A & B 07 = PIBAL PARTS A, B & C 99 = MISSING
C372	PT2. DATA SOURCE FLAG2 00 = NONE OF THIS SET 01 = DROPSONDE WINDS PART B 02 = DROPSONDE WINDS PART A 03 = DROPSONDE WINDS PARTS A & B 04 = PIBAL PART D 05 = PIBAL PART D AND DROP WINDS PART B 06 = PIBAL PART D AND DROP WINDS PART A 07 = PIBAL PART D AND DROP WINDS PARTS A & B 99 = MISSING
C373	RES. Reserved, coded as 9.
C374	PT3. DATA SOURCE FLAG3 00 = NONE OF THIS SET 01 = RESERVED 02 = SATELLITE (GOES, ATS, ETC.,) 03 = RESERVED 04 = SLAM 05 = RESERVED 06 = SLAM & SATELLITE VTPR 07 = RESERVED 99 = MISSING
C375	SFC VAL. Surface level validity. Following indicates the validity of the surface level data: 0 = Surface data passed validation 1 = Surface Pressure and/or Temperature invalidated, but remainder of sounding is hydrostatically consistent. 4 = Surface Pressure invalidated only. 9 = missing
C376	RES. Reserved, coded as 99.
C377	RES. Reserved, coded as 9.
C378	RES. Reserved, coded as 99.
C379	RES. Reserved, coded as 999.

4.4 Control Section for ROCOB Report.

FIELD C37 - KIND OF REPORT (ROCOB)

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
C371	NRI. No report indicator (00-09) according to WMO Code 0262. Missing coded as 99 (see APPENDIX C).
C372	TSI. Thermodynamic Sensing Equipment (00-79) according to WMO Code 1085. Missing coded as 99 (see APPENDIX C).
C373	TCI. Thermodynamic Correction (0-3) according to WMO Code 0659. Missing coded as 9 (see APPENDIX C).
C374	TDI. Thermodynamic Data Reducing (01-02,09) according to WMO Code 2649. Missing coded as 99 (see APPENDIX C).
C375	RMI. Rocket Motor Indicator (0-5) according to WMO Code 3644. Missing coded as 9 (see APPENDIX C).
C376	WEI. Wind Equipment Indicator (00-79) according to WMO Code 1095. Missing coded as 99 (see APPENDIX C).
C377	WCI. Wind Correction Technique (0-3) according to WMO Code 0659. Missing coded as 9 (see APPENDIX C).
C378	WRI. Wind Reduction Method (01-02,09) according to WMO Code 2649. Missing coded as 99 (see APPENDIX C).
C379	RES. Reserved, coded as 999.

Chapter 5

DATA FORMATS

5.1 RAOB Report Level Data Section.

FIELD NO.	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L12A
DATA							DEW PT						DPT
FIELD	DTI	RES	PRESS	HEIGHT	RES	TEMP	TEMP	RES	RES	RES	RES	RES	FLG
# CHARS	X	X	XXXXX	SXXXXX	X	XXXXX	XXXX	XXX	XXXX	X	XXX	XX	X
CHAR LOC	1	2	3-7	8-13	14	15-	19-22	23-	26-	30	31-	34-	36

FIELD NO.	L13	L14	L15	L16	L17	L18			
DATA									
FIELD	PFF	PSF	HFF	HSF	TFF	TSF	RES	RES	RES
# CHARS	XX	XX	XX	XX	XX	XX	XXXX	XXXX	XXXX
CHAR LOC	37-	39-	41-	43-	45-	47-	49-	53-	57-

Fields L01 through L18 are repeated for each level, up to a maximum of 160 levels.

FIELD	DESCRIPTION OF FIELD AND COMMENTS
L01	DTI. Data Type Indicator as follows: A = Surface Data B = Mandatory Level Data C = Significant Level Data G = Manual Report Level Data

Note: See Appendix D for descriptions of Data Type Indicators.

L02	RES. Reserved, coded as 9.
L03	PRESS. Pressure level (00000-99998) stored in tenths of millibars (e.g. 850.0 stored as 08500). Coded as 99999 when field is not reported.
L04	HEIGHT. Height (-99999 to +99998) of pressure level in whole meters. When height = 0, assume + and coded as +99999 when field is not reported.
L05	RES. Reserved, coded as 9.
L06	TEMP. Temperature (0000-9998) at pressure level stored in tenths of degrees Kelvin (e.g. 254.2 stored as 2542). Coded as 9999 when field is not reported.
L07	DEW PT TEMP. Dew Point Temperature (0000-9998) at pressure level stored in tenths of degrees Kelvin (e.g. 254.2 stored as 2542). Coded as 9999 when field is not reported.
L08	RES. Reserved, coded as 999.

CHAPTER 5

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
L09	RES. Reserved, coded as 9999.
L10	RES. Reserved, coded as 9.
L11	RES. Reserved, coded as 999.
L12	RES. Reserved, coded as 99.
L12A	DPF. Dew Point Flag (0-2,9) 0 = Dew Point not Recomputed or Suspect 1 = Dew Point Recomputed 2 = Dew Point Suspect 9 = Missing
L13	PFF. Pressure Fail Flag (00-87) PSF. Pressure Suspect Flag (00-77)
L14	HFF. Height Fail Flag (00-87) HSF. Height Suspect Flag (00-77)
L15	TFF. Temperature Fail Flag (00-87) TSF. Temperature Suspect Flag (00-77)
L16	RES. Reserved, coded as 9999.
L17	RES. Reserved, coded as 9999.
L18	RES. Reserved, coded as 9999.

Note: See Appendix E for a description of Fail & Suspect Flags.
Missing = 9999

5.2 RAOB Report Additional Data Section.

TROPOPAUSE LEVEL DATA

FIELD NO.	AD00	AD01	AD02	AD03	AD04	AD05	AD06	AD07	AD08
DATA					DEW				
FIELD	IND	PRESS	HEIGHT	TEMP	TEMP	FLG	DIR	SPEED	RESERVED
# CHARS	D	XXXXX	XXXXXXX	XXXX	XXXX	X	XXX	XXXX	XXXXXXXX
CHAR LOC	1	2-6	7-12	13-	17-	21	22-	25-	29-36

CLOUD DATA AND PRECIPITABLE WATER/PRESENT WEATHER

FIELD NO.	AF00	AF01	AF02	AF03	AF04	AF05	AF06	AT00	AT01	AT02	AT03	AT04
DATA								SAT				
FIELD	IND	TCC	LCT	CH	MCT	HCT	RES	IND	RATIO	WATER	WX	RES
# CHARS	F	XX	XX	XX	XX	XX	X	T	XXX	XXXX	XXXX	XXX XX
CHAR LOC	1	2-3	4-5	6-7	8-9	10-	12	13	14-	17-20	21-	25-36

STABILITY INDICES AND FREEZING LEVELS

FIELD NO.	AK00	AK01	AK02	AK03	AK04	AM00	AM01	AM02	AM03	AM04	AM05
DATA		SWEAT		SHOW-				FRZG	FRZG	FRZG	
FIELD	IND	INDEX	FLG	INDEX	RES	IND	RES	LVL 1	LVL 2	LVL 3	RESERVED
# CHARS	K	XXX	X	XX	X	M	XXX	SXXXX	SXXXX	SXXXX	XXXXXXXX
CHAR LOC	1	2-4	5	6-7	8	9	10-	13-17	18-22	23-27	28-36

THERMAL WINDS --- LEVELS 1, 2 & 3

FIELD NO.	AP00	AP01	AP02	AP03	AP04	AP05	AP06	AP07	AP08	AP09	AP10
DATA			LAYER 1		LAYER 2		LAYER 3				
FIELD	IND	NESS	DIR	SPD	NESS	DIR	SPD	NESS	DIR	SPD	RES
# CHARS	P	XXX	XXX	XXXX	XXX	XXX	XXXX	XXX	XXX	XXXX	XXXXX
CHAR LOC	1	2-4	5-7	8-11	12-14	15-	18-	22-24	25-	28-	32-36

DATA GROUP D — TROPOPAUSE LAYER DATA

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
AD00	IND. Value = D (GROUP MAY BE REPEATED UP TO A MAXIMUM OF 4 TIMES)
AD01	PRESS. Tropopause Pressure (00000-99998) stored in tenths of millibars (e.g. 10.3 mb stored as 00103). Missing coded as 99999.
AD02	HEIGHT. Tropopause Height (+00000 to +99998) stored in whole meters. Missing coded as +99999.
AD03	TEMP. Tropopause Temperature (0000-9998) stored in tenths of degrees Kelvin (e.g. 245.6 stored as 2456). Missing coded as 9999.
AD04	DEW PT TEMP. Tropopause Dew Point Temperature (0000-9998) stored in tenths of degrees Kelvin (e.g. 265.3 stored as 2653). Missing coded as 9999.
AD05	FLG. Tropopause Flag as follows: 0 = Reported 1 = Computed 8 = Invalidated 9 = Missing
AD06	WIND DIR. Tropopause level wind direction (001-360) in whole degrees. Calm = 000. Variable coded as 990 and missing coded as 999.
AD07	WIND SPEED. Tropopause level wind speed (0000-9998) stored in tenths of meters per second (e.g. 35.5 stored as 0355). Missing coded as 9999.
AD08	RESERVED. Coded as 99999999

DATA GROUP F — CLOUD DATA

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
AF00	IND. Value = F (cloud data)
AF01	TCC. Total Cloud Coverage (00-10) according to WMO Code 2700. Missing coded as 99 (see APPENDIX C).
AF02	LCT. Low Cloud Type (00-10) according to WMO Code 0513. Missing coded as 99 (see APPENDIX C).
AF03	CH. Cloud Height (00-10) according to WMO Code 1600. Missing coded as 99 (see APPENDIX C).
AF04	MCT. Middle Cloud Type (00-10) according to WMO Code 0515. Missing coded as 99 (see APPENDIX C).
AF05	HCT. High Cloud Type (00-10) according to WMO Code 0509. Missing coded as 99 (see APPENDIX C).
AF06	RES. Reserved, coded as 9.

DATA GROUP T — PRECIPITABLE WATER/PRESENT WEATHER

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
AT00	IND. Value = T (precipitable water)
AT01	SAT MOIST RATIO. Saturation Moisture Ratio in whole percent (000-100). Missing coded as 999.
AT02	PRECIP WATER. Precipitable Water Amount (0000-9998) stored in hundredths of an inch (e.g. 1.06 stored as 0106). Missing coded as 9999.
AT03	PRES WX 1 Present Weather codes ww1 (000-099). Missing coded 95999, according to WMO Code 4677 (see APPENDIX C).
AT04	Present Weather code ww2 (000-099). Missing coded as 999, according to WMO Code 4677 (see APPENDIX C).
AT05	Res. Reserved. Coded as 9999999999.

DATA GROUP K — STABILITY INDEXES

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
AK00	IND. Value = K (Stability Indices)
AK01	SWEAT INDEX. (000-998). Missing coded as 999.
AK02	FLG. Showalter Flag as follows: 0 = Reported 1 = Computed 9 = Missing
AK03	SHOW INDEX. Showalter Stability Index (00-99) Possible values are as follows: 0 = +0 or -0 1 thru 40 = +1 thru +40 41 thru 50 = not used 51 thru 90 = -1 thru -40 91 thru 98 = not used 99 = Missing
AK04	RES. Reserved, coded as 9.

DATA GROUP M -- FREEZING LEVELS

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
AM00	IND. Value = M (Freezing Level Data -- up to 3 levels)
AM01	RES. Reserved, coded as 999.
AM02	FRZG HT LVL1. Freezing Level 1 Height below 500mb (-9999 to +9998) in whole meters. Missing coded as +9999.
AM03	FRZG HT LVL2. Freezing Level 2 Height below 500mb (-9999 to +9998) in whole meters. Missing coded as +9999.
AM04	FRZG HT LVL3. Freezing Level 3 Height below 500mb (-9999 to +9998) in whole meters. Missing coded as +9999.
AM05	RESERVED. Coded as 999999999.

DATA GROUP P — THERMAL WINDS — LEVELS 1, 2 & 3

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
AP00	IND. Value = P
AP01	LAYER 1 THICKNESS. Thickness (000-998) in decameters of the 1000 - 700 mb layer. Missing coded as 999.
AP02	LAYER 1 WIND DIR. Thermal wind direction (001-360) in whole degrees, true, of the 1000 - 700 mb layer. Calm = 000, Variable = 990 and Missing coded as 999.
AP03	LAYER 1 WIND SPD. Thermal wind speed (0000-9998) in tenths of meters per second (e.g. 25.4 stored as 0254) of the 1000-700 mb layer. Missing coded as 9999.
AP04	LAYER 2 THICKNESS. Thickness (000-998) in decameters of the 1000 - 500 mb layer. Missing coded as 999.
AP05	LAYER 2 WIND DIR. Thermal wind direction (001-360) in whole degrees, true, of the 1000 - 500 mb layer. Calm = 000, Variable = 990 and Missing coded as 999.
AP06	LAYER 2 WIND SPD. Thermal wind speed (0000-9998) in tenths of meters per second (e.g. 25.4 stored as 0254) of the 1000-500 mb layer. Missing coded as 9999.
AP07	LAYER 3 THICKNESS. Thickness (000-998) in decameters of the 500 - 300 mb layer. Missing coded as 999.
AP08	LAYER 3 WIND DIR. Thermal wind direction (001-360) in whole degrees, true, of the 500 - 300 mb layer. Calm = 000, Variable = 990 and Missing coded as 999.
AP09	LAYER 3 WIND SPD. Thermal wind speed (0000-9998) in tenths of meters per second (e.g. 25.4 stored as 0254) of the 500 - 300 mb layer. Missing coded as 9999.
AP10	RES. Reserved, coded as 99999.

CHAPTER 5

5.3 RAOB Report Remarks Data Section.

FIELD NO.	N00	N01	N02	N03	N04
		DATA			
DATA		SOURCE		REM	REMARKS
FIELD	IND	IND	=	LENG	DATA
# CHARS	W	XX	X	XXXX	
CHAR LOC	1	2-3	4	5-8	9 - N

Remarks Data Section can be as long as necessary to include all 101 groups and non-decoded data. With multiple data source indicators, fields N00 - N04 can be repeated as many times as necessary.

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
N00	IND. Value = "W"
N01	DATA SOURCE IND. Data Source Indicator as follows: RA = RAOB Part A - Remarks Data RB = RAOB Part B - Remarks Data RC = RAOB Part C - Remarks Data RD = RAOB Part D - Remarks Data SL = SLAM - Remarks Data DA = Dropsonde Part A - Remarks Data DB = Dropsonde Part B - Remarks Data UU = Unknown
N02	= (Special Indicator)
N03	REM LENG. Length in words (0000-9999) of the remarks data for the source specified in N01.
N04	REMARKS DATA. Data in ASCII Characters

5.4 PIBAL Report Level Data Section.

FIELD NO.	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L12A
DATA								WIND	WIND				
FIELD	DTI	RES	PRESS	HEIGHT	FLG	RES	RES	DIR	SPD	RES	RES	RES	RES
# CHARS	X	X	XXXXX	SXXXXX	X	XXXX	XXXX	XXX	XXXX	X	XXX	XX	X
CHAR LOC	1	2	3-7	8-13	14	15-	19-22	23-	26-	30	31-	34-	36

FIELD NO.	L13	L14	L15	L16	L17	L18
DATA						
FIELD	RES	RES	RES	DSF	DSF	SSF
# CHARS	XXXX	XXXX	XXXX	XX	XX	XX
CHAR LOC	37-	41-	45-	49-	51-	53-

Fields L01 through L18 are repeated for each level, up to a maximum of 160 levels.

FIELD	DESCRIPTION OF FIELD AND COMMENTS
L01	DTI. Data Type Indicator as follows: A = Surface Data B = Mandatory Level Data C = Significant Level Data
L02	RES. Reserved, coded as 9.
L03	PRESS. Pressure level (00000-99998) stored in tenths of millibars (e.g. 850.0 stored as 08500). Coded as 99999 when field is not reported.
L04	HEIGHT. Height (-99999 to +99998) of pressure level in whole meters. When height = 0, assume + and coded as +99999 when field is not reported.
L05	FLG. Height Flag as follows: 0 = No flag set 1 = Height value has been recomputed due to missing or garbled reports, or computed for special levels 2 = Standard Atmosphere height values assigned in place of reported pressure 3 = Both 1 and 2 apply 4 = Surface Validated 9 = Missing
L06	RES. Reserved, coded as 9999.
L07	RES. Reserved, coded as 9999.
L08	WIND DIR. Wind Direction (001-360) at pressure level stored in whole degrees. Variable wind direction is coded as 990, calm as 000 and missing as 999.

CHAPTER 5

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
L09	WIND SPD. Wind speed (0000-9998) stored in tenths of meters per second (e.g. 32.2 stored as 0322). Calm=0000, missing=9999.
L10	RES. Reserved, coded as 9.
L11	RES. Reserved, coded as 999.
L12	RES. Reserved, coded as 99.
L12A	RES. Reserved, coded as 9.
L13	RES. Reserved, coded as 9999.
L14	RES. Reserved, coded as 9999.
L15	RES. Reserved, coded as 9999.
L16	DFF. Wind Direction Fail Flags (00-87) DSF. Wind Direction Suspect Flags (00-77)
L17	SFF. Wind Speed Fail Flags (00-87) SSF. Wind Speed Suspect Flags (00-77)
L18	RES. Reserved, coded as 9999.

Note: (1) See APPENDIX E for a description of Suspect and Fail Flags.
Missing = 9999.

5.5 PIBAL Report Additional Data Section.

MAXIMUM WIND DATA													
FIELD NO	AE00	AE01	AE02	AE03	AE04	AE05	AE06	AE07	AE08	AE09	AE10	AE11	AE12
		MAX	MAX		PRESS				MAX	MAX			
DATA		WND	WND		HGT				WND	WIND			
FIELD	IND	LOC	FLG	RES	FLG	PRESS	HEIGHT	RES	DIR	SPD	VDA	VDB	RES
#CHARS	E	X	X	X	X	XXXXX	SXXXXX	X	XXX	XXXX	XXXX	XXXX	XXXX
CHAR LOC	1	2	3	4	5	6-10	11-16	17	18-	21-	25-	29-	33-

MEAN WIND DATA									
FIELD NO.	AH00	AH01	AH02	AH03	AH04	AH05	AH06		
		LVL 1	LVL 1		LVL 2	LVL 2			
DATA		MN WND	MN WND		MN WND	MN WND			
FIELD	IND	DIR	SPD	RES	DIR	SPD	RESERVED		
# CHARS	H	XXX	XXXX	X	XXX	XXXX	XXXXXXXXXXXXXXXXXXXXXXX		
CHAR LOC	1	2-4	5-8	9	10-12	13-16	17-36		

DATA GROUP E -- PIBAL MAXIMUM WIND DATA

FIELD	DESCRIPTION OF FIELD AND COMMENTS
AE00	IND. Value = E (GROUP CAN BE REPEATED UP TO A MAXIMUM OF 4 TIMES)
AE01	MAX WND LOC. Maximum Wind Location as follows: 0 = Maximum wind is not a report terminating level. 1 = Maximum wind is a report terminating level. 9 = Missing
AE02	MAX WND FLG. Maximum Wind Report/Select Indicator as follows: 0 = Maximum Wind was reported. 1 = Maximum Wind was computed from reported winds. 9 = Missing
AE03	RES. Reserved, coded as 9.
AE04	PRESS/HGT FLG. Pressure/Height recompute flag as follows: 0 = Neither recomputed. 1 = Height recomputed due to missing or garbled data. 2 = Pressure recomputed due to missing or garbled data. 3 = Both recomputed. 9 = Missing
AE05	PRESS. Pressure (00000-99998) at the maximum wind level stored in tenths of millibars (e.g. 500.3 stored as 05003). Missing coded as 99999.
AE06	HEIGHT. Height (-99999 to +99998) of the maximum wind level stored in whole meters. When height = 0, assume +. Missing coded as +99999.

CHAPTER 5

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
AE07	RES. Reserved, coded as 9.
AE08	MAX WND DIR. Direction of maximum wind (001-360) in whole degrees, true. Missing coded as 999.
AE09	MAX WIND SPD. Maximum Wind Speed (0000-9998) stored in tenths of meters per second (e.g. 35.4 stored as 0354). Missing coded as 9999.
AE10	VDA. Absolute Value of the vector difference between the wind at the level of the maximum wind and the wind 3,000 feet above, (0000-9998) stored in tenths of meters per second (e.g. 35.4 stored as 0354). Missing coded as 9999.
AE11	VDB. Absolute value of the vector difference between the wind at the level of the maximum wind and the wind 3,000 feet below, (0000-9998) stored in tenths of meters per second (e.g. 35.4 stored as 0354). Missing coded as 9999.
AE12	RES. Reserved, coded as 9999.

DATA GROUP H -- PIBAL MEAN WIND DATA

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
AH00	IND. Value = H
AH01	LEVEL 1 MN WND DIR. Mean Wind Direction (001-360) of the surface to 5000 foot layer in whole degrees, true. Missing coded as 999.
AH02	LEVEL 1 MN WND SPD. Mean Wind Speed (0000-9998) of the surface to 5000 ft layer. Stored in tenths of meters per second (e.g. 35.4 stored as 0354). Missing coded as 9999.
AH03	RES. Reserved, coded as 9.
AH04	LEVEL 2 MN WND DIR. Mean Wind Direction (001-360) of the 5000 to 10000 foot layer in whole degrees, true. Missing coded as 999.
AH05	LEVEL 2 MN WND SPD. Mean Wind Speed (0000-9998) of the 5000 to 10000 ft layer. Stored in tenths of meters per second (e.g. 35.4 stored as 0354). Missing coded as 9999.
AH06	RESERVED. Coded as 99999999999999999999.

5.6 PIBAL Report Remarks Data Section.

FIELD NO.	N00	N01	N02	N03	N04
		DATA			
DATA		SOURCE		REM	REMARKS
FIELD	IND	IND	=	LNG	DATA
# CHARS	X	XX	X	XXXX	
CHAR LOC	1	2-3	4	5-8	9 - N

Remarks data section can be as long as necessary to include all non-decoded data. With multiple data source indicators, fields N00 - N04 can be repeated as many times as necessary.

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
N00	IND. Value = "X"
N01	DATA SOURCE IND. Data Source Indicator as follows: PA = PIBAL Part A - Remarks Data PB = PIBAL Part B - Remarks Data PC = PIBAL Part C - Remarks Data PD = PIBAL Part D - Remarks Data ST = GOES Satellite Winds - Remarks Data WA = Drop Winds Part A - Remarks Data WB = Drop Winds Part B - Remarks Data UU = Unknown
N02	= (Special Indicator)
N03	REM LENG. Length in words (0000-9999) of the remarks data for the source specified in N01.
N04	REMARKS DATA. Data in ASCII Characters

CHAPTER 5

5.7 ROCOB Report Level Data Section.

FIELD NO.	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12
DATA								WIND	WIND			
FIELD	DTI	PDL	PRESS	HEIGHT	RES	TEMP	RES	DIR	SPD	DDL	DENS	RES
# CHARS	X	X	XXXXX	SXXXXX	X	XXXX	XXXX	XXX	XXXX	X	XXX	XXX
CHAR LOC	1	2	3-7	8-13	14	15-	19-	23-	26-	30	31-	34-

FIELD NO.	L13		L14		L15		L16		L17		L18	
DATA												
FIELD	PFF	PSF	HFF	HSE	TFF	TSF	DSF	SFF	SSF	NFF	NSF	
# CHARS	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
CHAR LOC	37-	39-	41-	43-	45-	47-	49-	51-	53-	55-	57-	59-

Fields L01 through L18 are repeated for each level, up to a maximum of 160 levels.

FIELD	DESCRIPTION OF FIELD AND COMMENTS
L01	DTI. Data Type Indicator as follows: B = Mandatory Level Data C = Significant Level Data
L02	PDL. Pressure Decimal Location (0-5); where 0 = whole units, 1 = tenths, 2 = hundredths, etc. Missing coded as 9.
L03	PRESS. Pressure level (00000-99998), where Pressure = PRESS * 10**(-PDL) in millibars. Coded as 99999 when field is not reported.
L04	HEIGHT. Height (+00000 to +00999) of pressure level in hectometers (e.g. 24,900 meters coded as +00249). When height = 0, assume + and coded as +99999 when field is not reported.
L05	RES. Reserved, coded as 9.
L06	TEMP. Temperature (0000-9998) at pressure level stored in tenths of degrees Kelvin (e.g. 254.2 stored as 2542). Coded as 9999 when field is not reported.
L07	RES. Reserved, coded as 9999.
L08	WIND DIR. Wind Direction (001-360) at pressure level stored in whole degrees. Variable wind direction is coded as 990, calm as 000 and missing as 999.
L09	WIND SPD. Wind speed (0000-9998) stored in tenths of meters per second (e.g. 32.2 stored as 0322). Calm=0000, missing=9999.
L10	DDL. Density Decimal Location (0-8); where 0 = whole number, 1 = tenths, etc. Missing coded as 9.

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
L11	DENS. Density (000-998) in grams per cubic meter. Density = DENS * 10**(-DDL). Coded as 999 when field is not reported.
L12	RES. Reserved, coded as 99.
L12A	RES. Reserved, coded as 9.
L13	PFF. Pressure Fail Flag (00-87) PSF. Pressure Suspect Flag (00-77)
L14	HFF. Height Fail Flag (00-87) HSF. Height Suspect Flag (00-77)
L15	TFF. Temperature Fail Flag (00-87) TSF. Temperature Suspect Flag (00-77)
L16	DFF. Wind Direction Fail Flag (00-87) DSF. Wind Direction Suspect Flag (00-77)
L17	SFF. Wind Speed Fail Flag (00-87) SSF. Wind Speed Suspect Flag (00-77)
L18	NFF. Density Fail Flag (00-77) NSF. Density Suspect Flag (00-77)

Note: See APPENDIX E for a description of Suspect and Fail Flags.
Missing = 9999.

CHAPTER 5

5.8 ROCOB Report Remarks Data Section.

FIELD NO.	N00	N01	N02	N03	N04
		DATA			
DATA		SOURCE		REM	REMARKS
FIELD	IND	IND	=	LNG	DATA
# CHARS	Y	XX	X	XXXX	
CHAR LOC	1	2-3	4	5-8	9 - N

Remarks data section can be as long as necessary to contain all non-decoded data.

FIELD	DESCRIPTION OF FIELD AND COMMENTS
-------	-----------------------------------

N00	IND. Value = "Y"
-----	------------------

N01	DATA SOURCE IND. Data Source Indicator as follows: RO = ROCOB Non-decoded data UU = Unknown
-----	---------------------------------------------------------------------------------------------------

The following indicators apply to ROCOBs converted by OL-A, AFCCC from the World Data Center-A (WDC-A) rocketsonde format, a "1" in control field C35, (ref FMH#10, chapter 7):

RW = Special Sensor Type Code and Special Sensor Correction Method from WDC-A format, data record type = 00, columns 26-31

RY = Thermodynamic Base Data from WDC-A format, data record = 00, columns 66-78

RP = RAOB Release Point from WDC-A format, data record type = 00, columns 64-65

RI = RAOB Instrument Type from WDC-A format, data record type = 00, columns 62-63

RQ = Questionable Data from WDC-A format, data record type = 00 - 19, columns 36-61. If more than one WDC-A Questionable Data card was converted, the data format for the RQ indicator is: data in columns 36-61 of WDC-A record type = 00, followed by data in columns 36-61 of WDC-A record type = 01,....

RT = Temperature Corrections from WDC-A format, data record type = 30, columns 50-52. The data format for the RT indicator is: AAAAA is altitude data from WDCA columns 16-20, TTT is the temperature correctin. Multiple temperature correction data will be separated by ASCII blanks (e.g. AAAAA.TTT AAAAA.TTT AAAAA.TTT).

FIELDDESCRIPTION OF FIELD AND COMMENTS

RX = Special Sensor Data from WDC-A format, data record type = 30 and 40, columns 70-76. The data format for the RX indicator is: AAAAA.SSSSSSS where, AAAAA is altitude data from WDC-A columns 16-20 SSSSSSS is the special sensor data. Multiple special sensor data will be separated by ASCII blanks (e.g. AAAAA.SSSSSSS AAAAA.SSSSSSS AAAAA.SSSSSSS).

RF = Rate of Fall Data from WDC-A format, data record type = 30, columns 43-45. The data format for the RX indicator is: AAAAA.RRR where AAAAA is altitude from WDC-A columns 16-20 and RRR is the rate of fall data. Multiple special sensor data will be separated by ASCII blanks (e.g. AAAAA.RRR AAAAA.RRR AAAAA.RRR).

RR = Supplemental Data from WDC-A format, data record type = 70, columns 16-76. If more than one WDC-A Supplemental Data card was converted, the data format for the RR indicator is: data in columns 16-76 of the first WDC-A record type = 70, followed by data in columns 36-61 of the second WDC-A record type = 70, followed by data in columns 36-61 of the third WDC-A record type = 70,

N02

= (Special Indicator)

N03

REM LNG. Length in words (0000-9999) of the remarks data for the source specified in N01.

N04

REMARKS DATA. Data in ASCII Characters

APPENDIX A

AFGWC REGIONS DATA BASE

This table shows the Latitude-Longitude boundaries of the AFGWC Regions data base.

<u>AFGWC REGION</u>	<u>LATITUDES</u>	<u>LONGITUDES</u>
1	80.00 N - 90.00 N	180.00 W - 179.99 E
2	70.00 N - 79.99 N	180.00 W - 179.99 E
3	60.00 N - 69.99 N	180.00 W - 53.00 W
4	60.00 N - 69.99 N	52.99 W - 19.99 E
5	60.00 N - 69.99 N	20.00 E - 34.99 E
6	60.00 N - 69.99 N	35.00 E - 51.99 E
7	60.00 N - 69.99 N	52.00 E - 86.99 E
8	60.00 N - 69.99 N	87.00 E - 141.99 E
9	60.00 N - 69.99 N	142.00 E - 179.99 E
10	60.00 N - 59.99 N	180.00 W - 95.00 E
11	50.00 N - 59.99 N	94.99 W - 1.00 W
12	50.00 N - 59.99 N	0.00 W - 8.99 E
13	50.00 N - 59.99 N	9.00 E - 13.99 E
14	50.00 N - 59.99 N	14.00 E - 21.99 E
15	50.00 N - 59.99 N	22.00 E - 27.99 E
16	50.00 N - 59.99 N	28.00 E - 34.99 E
17	50.00 N - 59.99 N	35.00 E - 48.99 E
18	50.00 N - 59.99 N	49.00 E - 60.00 E
19	50.00 N - 59.99 N	61.00 E - 75.99 E
20	50.00 N - 59.99 N	76.00 E - 89.99 E
21	50.00 N - 59.99 N	90.00 E - 105.99 E
22	50.00 N - 59.99 N	106.00 E - 119.99 E
23	50.00 N - 59.99 N	120.00 E - 139.99 E
24	50.00 N - 59.99 N	140.00 E - 179.99 E
25	40.00 N - 49.99 N	180.00 W - 105.00 W
26	40.00 N - 49.99 N	104.99 W - 85.00 W
27	40.00 N - 49.99 N	84.99 W - 71.00 W
28	40.00 N - 49.99 N	70.99 W - 1.00 W
29	40.00 N - 49.99 N	0.99 W - 7.99 E
30	40.00 N - 49.99 N	8.00 E - 12.99 E
31	40.00 N - 49.99 N	13.00 E - 19.99 E
32	40.00 N - 49.99 N	20.00 E - 26.99 E
33	40.00 N - 49.99 N	27.00 E - 34.99 E
34	40.00 N - 49.99 N	35.00 E - 41.99 E
35	40.00 N - 49.99 N	42.00 E - 45.99 E
36	40.00 N - 49.99 N	46.00 E - 59.99 E
37	40.00 N - 49.99 N	60.00 E - 74.99 E
38	40.00 N - 49.99 N	75.00 E - 93.99 E
39	40.00 N - 49.99 N	94.00 E - 125.99 E
40	40.00 N - 49.99 N	126.00 E - 138.99 E

APPENDIX A

AFGWC REGIONS DATA BASE (cont.)

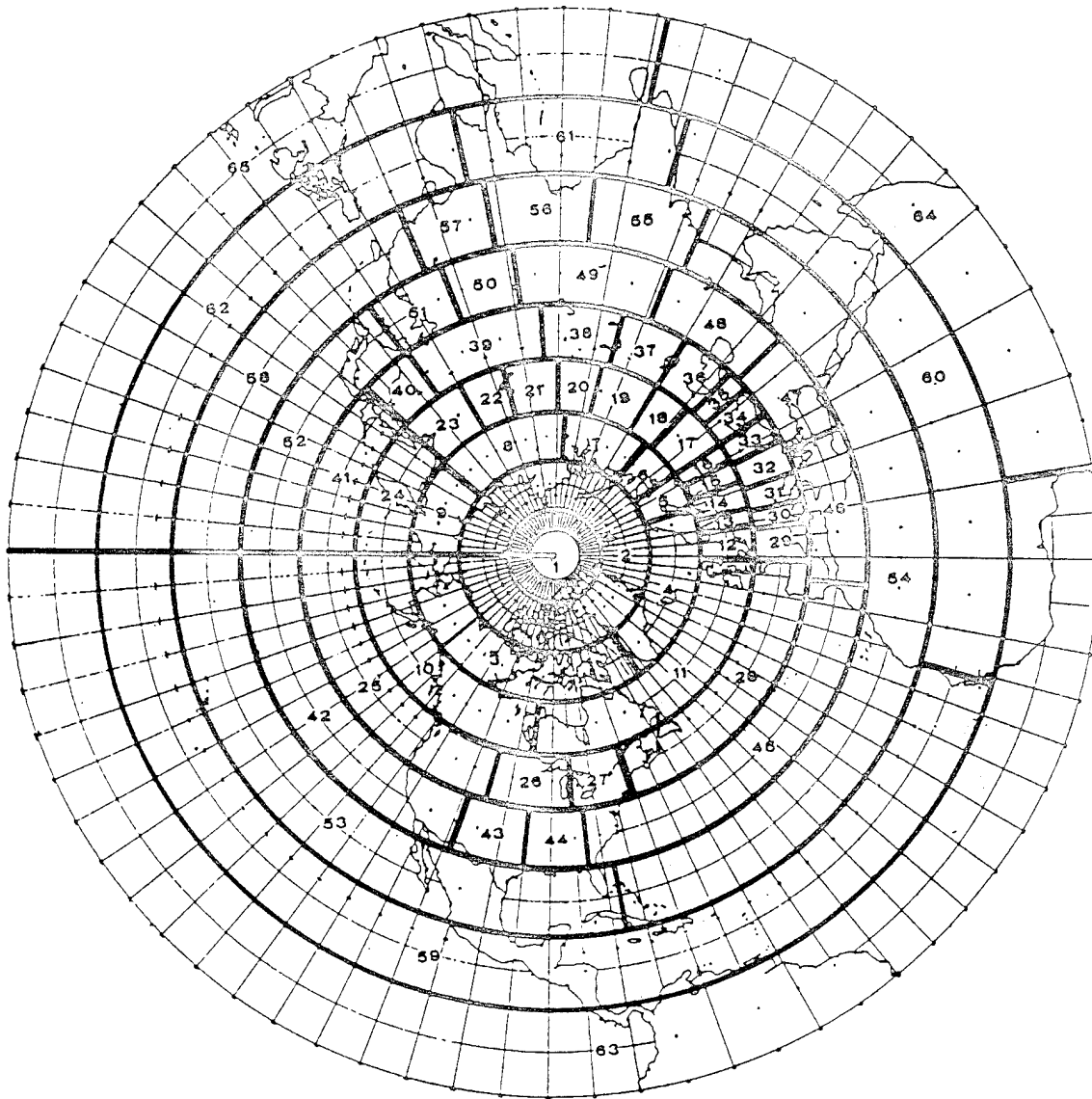
<u>AFGWC REGION</u>	<u>LATITUDES</u>	<u>LONGITUDES</u>
41	40.00 N - 49.99 N	139.00 E - 179.99 E
42	30.00 N - 39.99 N	180.00 W - 109.00 W
43	30.00 N - 39.99 N	108.99 W - 95.00 W
44	30.00 N - 39.99 N	94.99 W - 83.00 W
45	30.00 N - 39.99 N	82.99 W - 5.00 W
46	30.00 N - 39.99 N	4.99 W - 24.99 E
47	30.00 N - 39.99 N	25.00 E - 44.99 E
48	30.00 N - 39.99 N	45.00 E - 68.99 E
49	30.00 N - 39.99 N	69.00 E - 98.99 E
50	30.00 N - 39.99 N	99.00 E - 111.99 E
51	30.00 N - 39.99 N	112.00 E - 126.99 E
52	30.00 N - 39.99 N	127.00 E - 179.99 E
53	20.00 N - 29.99 N	180.00 W - 78.00 W
54	20.00 N - 29.99 N	77.99 W - 66.99 E
55	20.00 N - 29.99 N	67.00 E - 84.99 E
56	20.00 N - 29.99 N	85.00 E - 101.99 E
57	20.00 N - 29.99 N	102.00 E - 114.99 E
58	20.00 N - 29.99 N	115.00 E - 179.99 E
59	10.00 N - 19.99 N	180.00 W - 16.00 W
60	10.00 N - 19.99 N	15.99 E - 73.99 E
61	10.00 N - 19.99 N	74.00 E - 103.99 E
62	10.00 N - 19.99 N	104.00 E - 179.99 E
63	0.00 - 9.99 N	180.00 W - 9.99 E
64	0.00 - 9.99 N	10.00 E - 78.99 E
65	0.00 - 9.99 N	79.00 E - 179.99 E
66	0.01 S - 10.00 S	180.00 W - 33.99 E
67	0.01 S - 10.00 S	34.00 E - 179.99 E
68	10.01 S - 20.00 S	180.00 W - 23.99 E
69	10.01 S - 20.00 S	24.00 E - 179.99 E
70	20.01 S - 30.00 S	180.00 W - 47.00 W
71	20.01 S - 30.00 S	46.99 W - 113.99 E
72	20.01 S - 30.00 S	114.00 E - 179.99 E
73	30.01 S - 40.00 S	180.00 W - 56.00 W
74	30.01 S - 40.00 S	55.99 W - 179.99 E
75	40.01 S - 50.00 S	180.00 W - 179.99 E
76	50.01 S - 90.00 S	180.00 W - 179.99 E
77	LATE, LOCATABLE REPORTING SITES	
78	NO-ID'S, NON-LOCATABLE REPORTING SITES	
79	REJECTS	
80	OVERFLOWS, DATA NOT STORED FROM FULL REGIONS	
99	MISSING	

APPENDIX A

AFGWC REGIONS

Northern Hemisphere

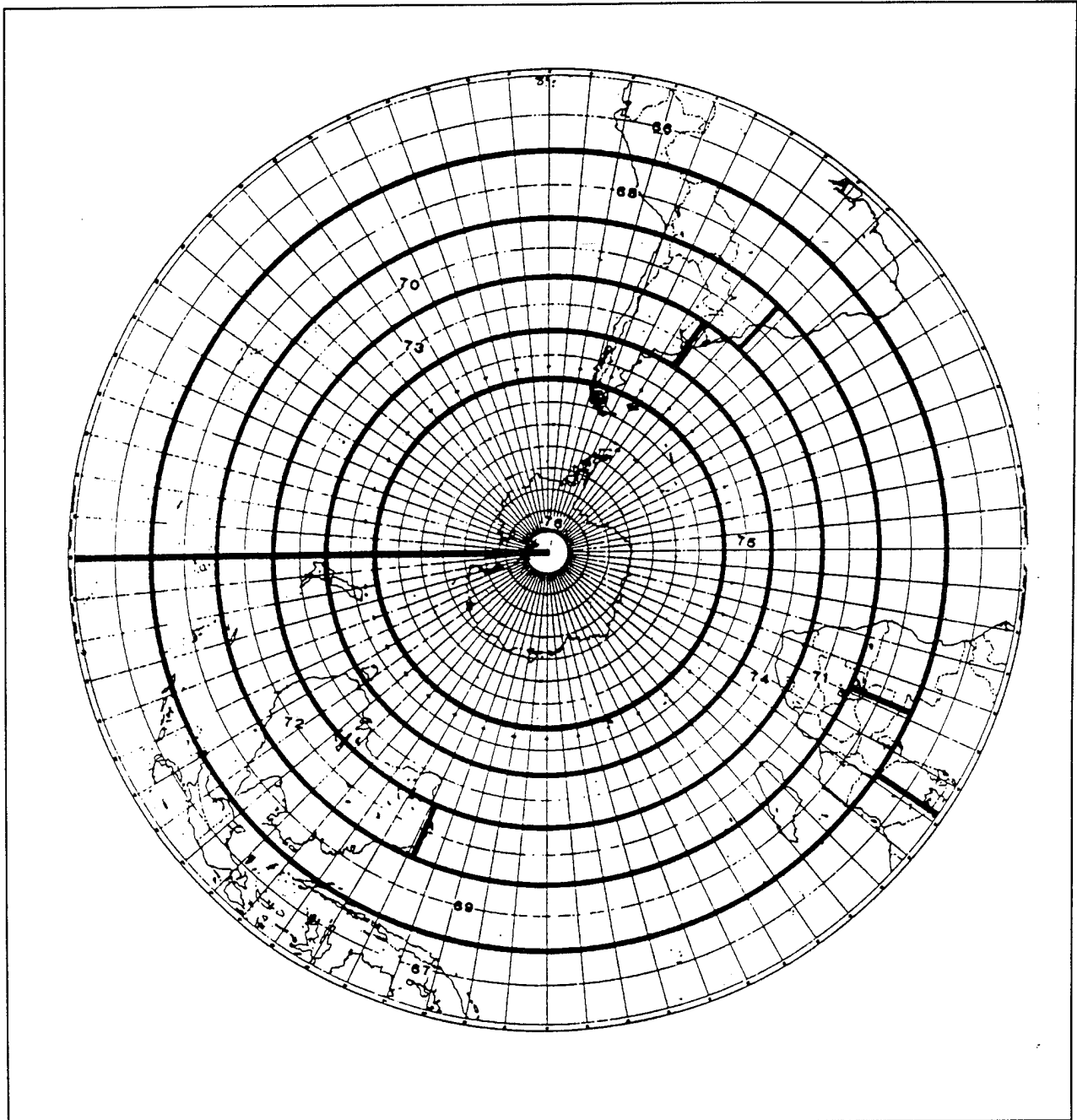
AFGWC Region Numbers



APPENDIX A

AFGWC REGIONS (cont.)

Southern Hemisphere



APPENDIX B

MARSDEN SQUARES - WMO CODE TABLE 2590

Symbol MMM = Number of Marsden Square for the Ship's Position at the Time of Observation

APPENDIX B

MARSDEN SQUARES - WMO CODE TABLE 2590 (cont.)

MMM

CODE TABLES

(Code table 2590—continued)

Note: The number to be coded for $U_{L_a}U_{L_o}$ in the position verifying group $MMMU_{L_a}U_{L_o}$ is obtained by combining the second figure for L_a and the third figure for L_o in the reported position ($L_aL_aL_a Q_cL_oL_oL_oL_o$). This number $U_{L_a}U_{L_o}$ is the number of the one-degree subdivision of the Marsden ten-degree square in which the ship is located at the time of observation.

When the ship is on the boundary between two (or four) ten-degree Marsden squares, the number to be coded for MMM is that of the Marsden ten-degree square in which the one-degree subdivision whose number is $U_{L_a}U_{L_o}$, as defined above, corresponds to the ship's position.

When the ship is on the meridian 0° or 180° , as well as on the Equator, the number used for reporting Q_c shall be taken into account for determining the relevant number of the Marsden ten-degree square.

Examples:

- (1) For a ship located at 42.3°N and 30.0°W , the position is coded as follows:

$$Q_c = 7, L_aL_aL_a = 423, L_oL_oL_oL_o = 0300$$

$U_{L_a}U_{L_o}$ is therefore **20**. The ship is on the boundary line between Marsden squares 147 and 148. The relevant scheme of the annex ($Q_c = 7$) shows that the one-degree subdivision corresponding to the ship's position would be numbered 29 in Marsden square 147 and **20** in Marsden square 148. MMM is therefore to be coded 148.

- (2) For a ship located at 40.0°S and 120.0°E , the position is coded as follows:

$$Q_c = 3, L_aL_aL_a = 400, L_oL_oL_oL_o = 1200$$

$U_{L_a}U_{L_o}$ is therefore **00**. The ship is on the boundary point between Marsden squares 431, 432, 467 and 468. The relevant scheme of the annex ($Q_c = 3$) shows that the one-degree subdivision corresponding to the ship's position would be 90 in Marsden square 431, 99 in Marsden square 432, **00** in Marsden square 467, and 09 in Marsden square 468. MMM is therefore to be coded 467.

(See annex on the next page)

APPENDIX B

MARSDEN SQUARES - WMO CODE TABLE 2590 (ANNEX)

CODE TABLES

MMM

(Code table 2590—continued)

ANNEX

Subdivisions of the Marsden ten-degree squares into one-degree squares for the eight octants (Q) of the globe

WEST

EAST

99	98	97	96	95	94	93	92	91	90
89									80
79									70
69									60
59									50
49									40
39									30
29									20
19									10
09	08	07	06	05	04	03	02	01	00

90	91	92	93	94	95	96	97	98	99
80									89
70									79
60									69
50									59
40									49
30									39
20									29
10									19
00	01	02	03	04	05	06	07	08	09

NORTH

$Q_c = 7$

$Q_c = 1$

09	08	07	06	05	04	03	02	01	00
19									10
29									20
39									30
49									40
59									50
69									60
79									70
89									80
99	98	97	96	95	94	93	92	91	90

00	01	02	03	04	05	06	07	08	09
10									19
20									29
30									39
40									49
50									59
60									69
70									79
80									89
90	91	92	93	94	95	96	97	98	99

SOUTH

$Q_c = 5$

$Q_c = 3$

APPENDIX C

RAOB INSTRUMENT TYPE, FIELD C-24

<u>AFGWC TYPE</u>	<u>AWSMSC TYPE</u>	<u>MANUFACTURER</u>	<u>INSTRUMENT TYPE</u>
01	N2	VIZ	1206 (403MHZ)
01	N6	VIZ	OMEGA (403MHZ)
01	N7	VIZ	J008 Solid State(1680)
01	N8	VIZ	1397 (72MHZ)
01	N9	VIZ	MICROSONDE (403MHZ)
01	N0	VIZ	?
01	NA	VIZ	1475 (403MHZ)
01	NB	VIZ	1395 (403MHZ)
01	NC	VIZ	1394 (403MHZ)
02	I1	PHILLIPS	ASTOR RS-4 (403MHZ)
02	N3	VIZ	1495 (403MHZ)
03	N4	VIZ	AMT-4B (1680MHZ)
05	K1	SANGAMO	(1680MHZ)
08	J3	METEORITE	A-22IV (216MHZ)
08	JA	METEORITE	A-22IV (400MHZ)
10	C1	GRAW/SPRENGER	M60 (403MHZ)
10	C2	GRAW	H60 (153MHZ)
10	CA	GRAW/SPRENGER	M60 (28MHZ)
10	N1	VIZ	1392 (1680MHZ)
11	H1	MESURAL	FMO 1950A (403MHZ)
11	H2	MESURAL	FMO 1945A (403MHZ)
11	H3	MESURAL	MH 73A (403MHZ)
12	L1	VAISALA	RS-18 (25MHZ)
12	L2	VAISALA	RS21-12C (403MHZ)
12	L3	VAISALA	RS21-13C (1680MHZ)
12	L4	VAISALA	WS-18 (25MHZ)
12	L5	VAISALA	RS-80 (403MHZ)
13	G1	MEISEI or OKI	RS-2-80 (1680MHZ)
16	J1	METEORITE	RKZ-2 (1782MHZ)
16	J2	METEORITE	RKZ-5 (1782MHZ)
17	N5	VIZ	LORAN-C (403MHZ)
17	O1	UK MET. OFFICE	U.K. RS (28MHZ)
25	00	UNKNOWN	UNKNOWN
25	B1	ELIN	2402 (403MHZ)
25	D1	INDIA MET SERV.	A-SONDE MKIII (401 or 1680MHZ)
25	E1	JINYANG(VIZ)	(1680MHZ)
25	F1	METEOLABOR	BASORA (403MHZ)
25	M1	VINOHRADY	ZAP MARS 4WF BERLIN (1680MHZ)
99	MISSING		

APPENDIX C

WMO CODE TABLES

CODE 0262

a₁ Reason for no report or ground equipment employed

- 00 - Launch not scheduled
- 01 - Rocket motor failure
- 02 - Instrument (or) telemetry signal not received
- 03 - Ground tracking equipment failure
- 04 - Weather prohibited launch
- 05 - Range restrictions prohibited launch
- 06 - Lack of expendables prohibited launch
- 07 - Radar not employed
- 08 - Radar and telemetry equipment employed
- 09 - Telemetry equipment only employed

CODE 0265

a₄ - Type of measuring equipment used

- 0 - Pressure instrument associated with wind-measuring equipment
- 1 - Optical theodolite
- 2 - Radio theodolite
- 3 - Radar
- 4 - Pressure instrument associated with wind-measuring equipment but pressure element failed during ascent
- 5 - VLF-Omega
- 6 - LORAN-C
- 7 - Wind Profiler
- 8 - Satellite Navigation
- 9 - Missing

CODE 0509

C_H - Clouds of the genera Cirrus, Cirrocumulus and Cirrostratus

- 00 - No Cirrus, Cirrocumulus or Cirrostratus
- 01 - Cirrus in the form of filaments, strands or hooks, not progressively invading the sky
- 02 - Dense Cirrus, in patches or entangled sheaves, which usually do not increase and sometimes seem to be the remains of the upper part of a Cumulonimbus; or Cirrus with sproutings in the form of small turrets or battlements, or Cirrus having the appearance of cumuliform tufts
- 03 - Dense Cirrus, often in the form of an anvil, being the remains of the upper parts of Cumulonimbus
- 04 - Cirrus in the form of hooks or of filaments, or both, progressively invading the sky; they generally become denser as a whole
- 05 - Cirrus (often in bands converging towards one point or two opposite points of the horizon) and Cirrostratus, or Cirrostratus alone; in either case, they are progressively invading the sky, and generally growing denser as a whole, but the continuous veil does not reach 45° above the horizon
- 06 - Cirrus (often in bands converging towards one point or two opposite points of the horizon) and Cirrostratus, or Cirrostratus alone; in either case, they are progressively invading the sky, and generally growing denser as a whole, the continuous veil extends more than 45° above the horizon, without the sky being totally covered

APPENDIX C

WMO CODE TABLES (cont.)

CODE 0509 (cont.)

CODE 0509 (CONTINUED)

- 07 - Veil of Cirrostratus covering the celestial dome.
- 08 - Cirrostratus not progressively invading the sky and not completely covering the celestial dome.
- 09 - Cirrocumulus alone, or Cirrocumulus accompanied by Cirrus or Cirrostratus, or both, but Cirrocumulus is predominate.
- 10 - Cirrus, Cirrocumulus, and Cirrostratus invisible owing to darkness, fog, blowing dust and sand, or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds.

CODE 0513

- C_L** - Clouds of the genera Stratocumulus, Stratus, Cumulus and Cumulonimbus
- 00 - No Stratocumulus, Stratus, Cumulus or Cumulonimbus
- 01 - Cumulus with little vertical extent and seemingly flattened, or ragged Cumulus other than of bad weather*, or both
- 02 - Cumulus of moderate or strong vertical extent, generally with protuberances in the form of domes or towers, either accompanied or not by other Cumulus or by Stratocumulus, all having their bases at the same level
- 03 - Cumulonimbus the summits of which, at least partially, lack sharp outlines, but are neither clearly fibrous (cirriform) nor in the form of an anvil; Cumulus, Stratocumulus or Stratus may also be present
- 04 - Stratocumulus formed by the spreading out of Cumulus; Cumulus may also be present
- 05 - Stratocumulus not resulting from the spreading out of Cumulus
- 06 - Stratus in a more or less continuous sheet or layer, or in ragged shreds, or both, but no Stratus fractus of bad weather*
- 07 - Stratus fractus of bad weather* or Cumulus fractus of bad weather*, or both(pannus), usually below Altostratus or Nimbostratus
- 08 - Cumulus and Stratocumulus other than that formed from the spreading out of Cumulus; the base of the Cumulus is at a different level from that of the Stratocumulus
- 09 - Cumulonimbus, the upper part of which is clearly fibrous(cirriform), often in the form of an anvil; either accompanied or not by Cumulonimbus without anvil or fibrous upper part, by Cumulus, Stratocumulus, Stratus or pannus
- 10 - Stratocumulus, stratus, cumulus and cumulonimbus invisible owing to darkness, fog, blowing dust or sand or other similar phenomena

* "Bad Weather" denotes the conditions which generally exist during precipitation and a short time before and after.

APPENDIX C

WMO CODE TABLES (cont.)

CODE 0515

C_M - Clouds of the genera *Alto cumulus*, *Alto stratus* and *Nimbo stratus*

- 00 - No *Alto cumulus*, *Alto stratus* or *Nimbo stratus*
- 01 - *Alto stratus*, the greater part of which is semi-transparent; through this part the sun or moon may be weakly visible, as through ground glass
- 02 - *Alto stratus*, the greater part of which is sufficiently dense to hide the sun or moon, or *Nimbo stratus*
- 03 - *Alto cumulus*, the greater part of which is semi-transparent; the various elements of the cloud change only slowly and are all at a single level
- 04 - Patches (often in the form of almonds or fishes) of *Alto cumulus*, the greater part of which is semi-transparent; the clouds occur at one or more levels and the elements are continually changing in appearance
- 05 - Semi-transparent *Alto cumulus* in bands, or *Alto cumulus*, in one or more fairly continuous layer (semi-transparent or opaque), progressively invading the sky; these *Alto cumulus* clouds generally thicken as a whole
- 06 - *Alto cumulus* resulting from the spreading out of *Cumulus* (or *Cumulonimbus*)
- 07 - *Alto cumulus* in two or more layers, usually opaque in places, and not progressively invading the sky; or opaque layer of *Alto cumulus*, not progressively invading the sky; or *Alto cumulus* together with *Alto stratus* or *Nimbo stratus*.
- 08 - *Alto cumulus* with sproutings in the form of small towers or battlements, of *Alto cumulus* having the appearance of cumuloform tufts
- 09 - *Alto cumulus* of a chaotic sky, generally at several levels
- 10 - *Alto cumulus*, *Alto stratus*, and *Nimbo stratus* invisible owing to darkness, fog, blowing dust and sand, or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds

CODE 0659

C_T - Thermodynamic correction technique

C_W - Wind correction technique

- 0 - No correction applied
- 1 - US standard correction
- 2 - UK standard correction
- 3 - Japan standard correction
- 4-9 Unassigned

CODE 1085

e_{TeT} - Type of thermodynamic sensing equipment

- 00 - No thermodynamic sensor
- 01-49 - Sonde
- 50-54 - Sphere
- 55-59 - Grenade
- 60-64 - Density gauge
- 65-69 - Pressure gauge
- 70-79 - Remote sensing
- 80-99 - Unassigned

NOTE: When specifications indicating experimental equipment are reported, plain language remarks explaining the experimental nature of the equipment shall be added at the end of the coded report.

APPENDIX C

WMO CODE TABLES (cont.)

CODE 1095

e_w - Type of wind sensing equipment

- 00 - No wind sensor
- 01-09 - Chaff
- 10-29 - Parachute
- 30-49 - Starute
- 50-54 - Sphere
- 55-59 - Grenade
- 60-64 - Chemical trail
- 65-69 - Meteor trail
- 70-79 - Remote sensing
- 80-99 - Unassigned

NOTE: When specifications indicating experimental equipment are reported, plain language remarks explaining the experimental nature of the equipment shall be added at the end of the coded report.

CODE 1600

h - Height above surface of the base of the lowest cloud seen

- 00 - 0 to 50 meters
- 01 - 50 to 100m
- 02 - 100 to 200m
- 03 - 200 to 300m
- 04 - 300 to 600m
- 05 - 600 to 1000m
- 06 - 1000 to 1500m
- 07 - 1500 to 2000m
- 08 - 2000 to 2500m
- 09 - 2500m or more, or no clouds
- 10 - Height of base of cloud not known or base of clouds at a level lower and tops at a level higher than that of the station

CODE 2649

m_r - Method of reducing data

- 01 - Manually - Nomogram
- 02 - Electronic computer
- 09 - Other method

NOTE: Code figure 01 shall be reported if all, or any portion, of the data reduction was manual. Code figure 02 shall be reported only when all the data reduction was by electronic computer.

APPENDIX C

WMO TABLES (cont.)

CODE 2700

- N - Total cloud cover
 Nh - Amount of the Cl or Cm cloud cover
 Ns - Amount of individual cloud layer or mass whose genus is indicated by C
 N' - Amount of cloud whose base is below the level of the station
- | | |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| 00 - zero | zero |
| 01 - 1 okta or less, but not zero | 1/10 or less, but not zero |
| 02 - 2 oktas | 2/10 - 3/10 |
| 03 - 3 oktas | 4/10 |
| 04 - 4 oktas | 5/10 |
| 05 - 5 oktas | 6/10 |
| 06 - 6 oktas | 7/10 - 8/10 |
| 07 - 7 oktas or more, but not 8 oktas | 9/10 or more, but not 10/10 |
| 08 - 8 oktas | 10/10 |
| 09 - Sky obscured, or cloud amount cannot be estimated | |
| 10 - Cloud cover is indiscernible for reason other than fog or other Meteorological phenomena, or observation not made. | |

CODE 3644

r_M - Type of rocket motor

- 0 - 114 mm(4.5 in) end burning
- 1 - 76 mm(3.0 in) internal burning
- 2 - Boosted, 114 mm(4.5 in) end burning
- 3 - Boosted, 76 mm(3.0 in) internal burning
- 4 - 135 mm(5.3 in) internal burning
- 5 - 160 mm(6.3 in) internal burning
- 6-9 Not used

APPENDIX C

WMO CODE 4677

ww - Present Weather

CODE TABLES

ww

4677

ww—Present weather reported from a manned weather station

ww = 00–49 *No precipitation at the station at the time of observation*

ww = 00–19 No precipitation, fog, ice fog (except for 11 and 12), dust-storm, sandstorm, drifting or blowing snow at the station* at the time of observation or, except for 09 and 17, during the preceding hour

Code figure ww		
No meteors except photometeors	00	Cloud development not observed or not observable
	01	Clouds generally dissolving or becoming less developed
	02	State of sky on the whole unchanged
	03	Clouds generally forming or developing
Haze, dust, sand or smoke	04	Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes
	05	Haze
	06	Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation
	07	Dust or sand raised by wind at or near the station at the time of observation, but no well-developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen; or, in the case of ships, blowing spray at the station
	08	Well-developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no duststorm or sandstorm
	09	Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour
	10	Mist
	11	Patches
	12	More or less
	12	continuous
		shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea
	13	Lightning visible, no thunder heard

(continued)

* The expression "at the station" refers to a land station or a ship.

APPENDIX C

CODE 4677 (cont.)

ww - Present Weather

ww

CODE TABLES

(Code table 4677—continued)

Code figure

- | | | |
|----|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 14 | Precipitation within sight, not reaching the ground or the surface of the sea | |
| 15 | Precipitation within sight, reaching the ground or the surface of the sea, but distant, i.e. estimated to be more than 5 km from the station | |
| 16 | Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station | |
| 17 | Thunderstorm, but no precipitation at the time of observation | |
| 18 | Squalls | } at or within sight of the station during the preceding hour or at the time of observation |
| 19 | Funnel cloud(s)* | |

ww = 20-29 Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation

ww

- | | | |
|----|----------------------------------------------|----------------------------|
| 20 | Drizzle (not freezing) or snow grains | } not falling as shower(s) |
| 21 | Rain (not freezing) | |
| 22 | Snow | |
| 23 | Rain and snow or ice pellets | |
| 24 | Freezing drizzle or freezing rain | |
| 25 | Shower(s) of rain | |
| 26 | Shower(s) of snow, or of rain and snow | |
| 27 | Shower(s) of hail**, or of rain and hail** | |
| 28 | Fog or ice fog | |
| 29 | Thunderstorm (with or without precipitation) | |

ww = 30-39 Duststorm, sandstorm, drifting or blowing snow

ww

- | | | |
|----|----------------------------------------------|--------------------------------------------------------|
| 30 | } Slight or moderate dust-storm or sandstorm | - has decreased during the preceding hour |
| 31 | | - no appreciable change during the preceding hour |
| 32 | | - has begun or has increased during the preceding hour |

* Tornado cloud or waterspout.

** Hail, small hail, snow pellets. French: grêle, grésil ou neige roulée.

APPENDIX C

WMO CODE 4677 (cont.)

ww - Present Weather

CODE TABLES

ww

(Code table 4677—continued)

Code figure

33	Severe duststorm or sandstorm	{	- has decreased during the preceding hour
34			- no appreciable change during the preceding hour
35			- has begun or has increased during the preceding hour
36	Slight or moderate drifting snow	{	generally low
37	Heavy drifting snow		(below eye level)
38	Slight or moderate blowing snow	{	generally high
39	Heavy blowing snow		(above eye level)

ww = 40-49 Fog or ice fog at the time of observation

ww

40	Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer		
41	Fog or ice fog in patches		
42	Fog or ice fog, sky visible	}	has become thinner during the preceding hour
43	Fog or ice fog, sky invisible		
44	Fog or ice fog, sky visible	}	no appreciable change during the preceding hour
45	Fog or ice fog, sky invisible		
46	Fog or ice fog, sky visible	}	has begun or has become thicker during the preceding hour
47	Fog or ice fog, sky invisible		
48	Fog, depositing rime, sky visible		
49	Fog, depositing rime, sky invisible		

ww = 50-99 Precipitation at the station at the time of observation

ww = 50-59 Drizzle

ww

50	Drizzle, not freezing, intermittent	}	slight at time of observation
51	Drizzle, not freezing, continuous		
52	Drizzle, not freezing, intermittent	}	moderate at time of observation
53	Drizzle, not freezing, continuous		
54	Drizzle, not freezing, intermittent	}	heavy (dense) at time of observation
55	Drizzle, not freezing, continuous		
56	Drizzle, freezing, slight		

(continued)

APPENDIX C

WMO CODE 4677 (cont.)

ww - Present Weather

ww

CODE TABLES

(Code table 4677—continued)

Code figure

- 57 Drizzle, freezing, moderate or heavy (dense)
- 58 Drizzle and rain, slight
- 59 Drizzle and rain, moderate or heavy

ww = 60–69 Rain

ww

- | | | |
|------------------------------------------------|---|------------------------------------|
| 60 Rain, not freezing, intermittent | } | slight at time of ob-
servation |
| 61 Rain, not freezing, continuous | | |
| 62 Rain, not freezing, intermittent | } | moderate at time of
observation |
| 63 Rain, not freezing, continuous | | |
| 64 Rain, not freezing, intermittent | } | heavy at time of ob-
servation |
| 65 Rain, not freezing, continuous | | |
| 66 Rain, freezing, slight | | |
| 67 Rain, freezing, moderate or heavy | | |
| 68 Rain or drizzle and snow, slight | | |
| 69 Rain or drizzle and snow, moderate or heavy | | |

ww = 70–79 Solid precipitation not in showers

ww

- | | | |
|-----------------------------------------------------------|---|------------------------------------|
| 70 Intermittent fall of snowflakes | } | slight at time of ob-
servation |
| 71 Continuous fall of snowflakes | | |
| 72 Intermittent fall of snowflakes | } | moderate at time of
observation |
| 73 Continuous fall of snowflakes | | |
| 74 Intermittent fall of snowflakes | } | heavy at time of ob-
servation |
| 75 Continuous fall of snowflakes | | |
| 76 Diamond dust (with or without fog) | | |
| 77 Snow grains (with or without fog) | | |
| 78 Isolated star-like snow crystals (with or without fog) | | |
| 79 Ice pellets | | |

APPENDIX C

WMO CODE 4677 (Continued)

ww - Present Weather

CODE TABLES

ww

(Code table 4677 — continued)

ww = 80–99 Showery precipitation, or precipitation with current or recent thunderstorm

Code figure

ww		
80	Rain shower(s), slight	
81	Rain shower(s), moderate or heavy	
82	Rain shower(s), violent	
83	Shower(s) of rain and snow mixed, slight	
84	Shower(s) of rain and snow mixed, moderate or heavy	
85	Snow shower(s), slight	
86	Snow shower(s), moderate or heavy	
87	{ Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed }	– slight
88	{ or rain and snow mixed }	– moderate or heavy
89	{ Shower(s) of hail*, with or without rain or rain and snow mixed, not associated with thunder }	– slight
90	{ }	– moderate or heavy
91	Slight rain at time of observation	Thunderstorm during the preceding hour but not at time of observation
92	Moderate or heavy rain at time of observation	
93	Slight snow, or rain and snow mixed or hail** at time of observation	
94	Moderate or heavy snow, or rain and snow mixed or hail** at time of observation	
95	Thunderstorm, slight or moderate, without hail**, but with rain and/or snow at time of observation	Thunderstorm at time of observation
96	Thunderstorm, slight or moderate, with hail** at time of observation	
97	Thunderstorm, heavy, without hail**, but with rain and/or snow at time of observation	
98	Thunderstorm combined with dust- storm or sandstorm at time of obser- vation	
99	Thunderstorm, heavy, with hail** at time of observation	

* French: grêle.

** Hail, small hail, snow pellets. French: grêle, grésil ou neige roulée.

APPENDIX D

DATA TYPE INDICATORS

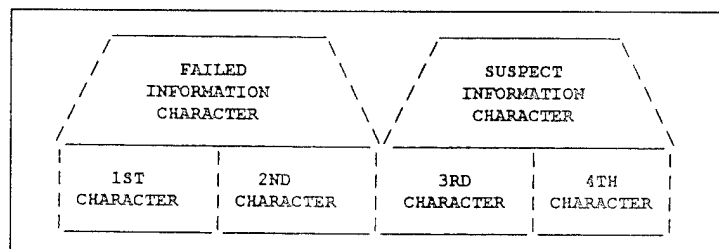
DATSAV2 CODE	DATA TYPE	DATA GROUP	FORMAT TYPE
A	RAOB/PIBAL SURFACE	LEVEL DATA	LEVEL
B	RAOB/PIBAL/ROCOB	MANDATORY	LEVEL DATA LEVEL
C	RAOB/PIBAL/ROCOB	SIGNIFICANT LEVEL DATA	LEVEL
D	RAOB	ROTPAUSE DATA	ADDITIONAL
E	RAOB/PIBAL	MAXIMUM WIND DATA	ADDITIONAL
F	RAOB	CLOUD DATA	ADDITIONAL
H	RAOB/PIBAL	MEAN WIND DATA, SFC-5000 FEET	ADDITIONAL
K	RAOB	STABILITY INDEX DATA	ADDITIONAL
M	RAOB	FREEZING LEVEL DATA	ADDITIONAL
P	RAOB	THERMAL WINDS DATA	ADDITIONAL
T	RAOB	PRECIP WATER/PRESENT WEATHER	ADDITIONAL
U	RAOB/PIBAL/ROCOB	OTHER CARDS LEVEL TYPES	LEVEL
W	RAOB	REMARKS DATA	REMARKS
X	PIBAL	REMARKS DATA	REMARKS
Y	ROCOB	REMARKS DATA	REMARKS
Z	RAOB/PIBAL/ROCOB	REJECTS DATA	REJECTS

APPENDIX E

VALIDATION FLAGS (in LEVEL DATA sections)

Each meteorological element (pressure, height, temperature, wind direction, wind velocity, and density) will be flagged when it either fails during validation or is identified as being suspect. Values which fail will either be recomputed or set to missing in most cases (values will not normally be rejected if they fail only the First Guess Field Check).

Each flag word will contain four characters; "0000." The first two will identify checks that the element failed and the remaining two character bytes will identify checks that were suspect during the validation checks. Character 1 is the left-most character.



CHARACTER 1 (FAIL): Validation code's 1st Character

<u>VALUE</u>	<u>MEANING</u>
0	No Internal Consistency or Meteorological Failures
1	NOT USED
2	Failed Internal Consistency Check Only.
3	NOT USED
4	Failed Meteorological Check Only.
5	NOT USED
6	Failed Internal Consistency and Meteorological Checks.
7	NOT USED
8	ELEMENT RECOMPUTED (in data prior to JAN 1989 and from TDF63 data)
9	MISSING

CHARACTER 2 (FAIL): Validation code's 2nd Character

<u>VALUE</u>	<u>MEANING</u>
0	No 101 Group, Gross Error or First-Guess Failures.
1	Failed 101 Check Only.
2	Failed Gross Error Check Only.
3	Failed 101 Group and Gross Error Checks.
4	Failed First-Guess Checks Only.
5	Failed 101 Group and First-Guess Checks.
6	Failed Gross Error and First-Guess Checks.
7	Failed 101 Group, Gross Error and First-Guess Checks.
8	NOT USED
9	MISSING

NOTE: (1) Only Values 0, 2 and 9 are used with density.
 (2) Values 0, 2, 8 and 9 are used with pressure.

APPENDIX E

CHARACTER 3 (SUSPECT): Validation code's 3rd Character

<u>VALUE</u>	<u>MEANING</u>
0	No Internal Consistency or Meteorological Suspects.
1	Pressure received Out of Sequence.
2	Suspect by Internal Consistency Check Only.
3	Pressure received Out of Sequence and Suspect by Internal Consistency Check.
4	Suspect by Meteorological Check Only.
5	Pressure received Out of Sequence and Suspect by Meteorological Checks.
6	Suspect by Internal Consistency and Meteorological Checks.
7	Pressure received Out of Sequence and Suspect by Internal Consistency and Meteorological Checks.
8	NOT USED
9	MISSING

CHARACTER 4 (SUSPECT): Validation code's 4th Character

<u>VALUE</u>	<u>MEANING</u>
0	No 101 Group, Gross Error or First-Guess Suspects.
1	Suspect by 101 Group Checks Only.
2	Suspect by Gross Error Check Only.
3	Suspect by 101 Group and Gross Error Checks.
4	Suspect by First-Guess Checks Only.
5	Suspect by 101 Group and First-Guess Checks.
6	Suspect by Gross Error and First-Guess Checks.
7	Suspect by 101 Group, Gross Error and First Guess Checks.
8	NOT USED
9	MISSING

NOTE: Only Values 0, 2 and 9 are used for PRESSURE and DENSITY.

APPENDIX F

A. Rejected Data Section

The rejected section is usually for OL-A, AFCCC, use only. It contains the original values for those fields deemed to be in error by AFGWC or OL-A, AFCCC. Control field C05 indicates the number of characters in this section. Data sent out of OL-A that doesn't include reject data contains character "9s" in C05. Also, field C01 (total character count for entire observation) counts rejects section characters for in-house data, but not for data sent outside of OL-A.

APPENDIX F

B. RAOB Report Rejected Data Section

FIELD NO.	R00	R01	R02	R03	R04	R05	R06
DATA FIELD	IND	RES	=	PRESS LEVEL	REJ ELM IND	RES	VALUE
# CHARS	Z	XX	X	XXXXXXX	X	X	SXXXXXXXX
CHAR LOC	1	2-3	4	5-10	11	12	13-20

Fields R03 through R06 are repeated for each rejected data element.

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
R00	IND. Value = "Z"
R01	RES. Reserved, ASCII blank-filled
R02	= (Special Indicator)
R03	PRESS LEVEL. Pressure level of rejected element stored in tenths of millibars (e.g. 771.3 stored as 007713). If R04 = P, then R03 is recomputed pressure.
R04	REJ ELM IND. Rejected element indicator as follows: P = Pressure H = Height T = Temperature D = Dew Point A = Wind Direction F = Wind Speed Note: RAOB Element rejected by pressure level.
R05	RES. Reserved, coded as 9.
R06	VALUE. Rejected element's value (-9999999 to +9999999). The value is stored in the same format as in the mandatory and additional data sections.

Note: The rejected fields for the RAOB section contain original unchanged values for those fields deemed to be in error.

APPENDIX F

C. PIBAL Reports Rejected Data Section

FIELD NO.	R00	R01	R02	R03	R04	R05	R06
DATA FIELD	IND	RES	=	HGT LEVEL	REJ ELM IND	RES	VALUE
# CHARS	Z	XX	X	XXXXXX	X	X	XXXXXXXX
CHAR LOC	1	2-3	4	5-10	11	12	13-20

Fields R03 through R06 are repeated for each rejected data element.

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
R00	IND. Value = "Z"
R01	RES. Reserved, ASCII blank-filled
R02	= (Special Indicator)
R03	HGT LEVEL. Height level of rejected element stored in whole meters. If R04 = H, then R03 is recomputed height.
R04	REJ ELM IND. Rejected element indicator as follows: H = Height P = Pressure A = Wind Direction F = Wind Speed
R05	RES. Reserved, coded as 9.
R06	VALUE. Rejected element's value (-9999999 to +9999999). The value is stored in the same format as in the mandatory and additional data sections.

Note: The rejected fields for the PIBAL section contain original unchanged values for those fields deemed to be in error.

APPENDIX F

D. ROCOB Reports Rejected Data Section

FIELD NO.	R00	R01	R02	R03	R04	R05	R06
DATA FIELD	IND	RES	=	HGT LEVEL	REJ ELM IND	RES	VALUE
# CHARS	Z	XX	X	XXXXXXX	X	X	XXXXXXXXX
CHAR LOC	1	2-3	4	5-10	11	12	13-20

Fields R03 through R06 are repeated for each rejected data element.

<u>FIELD</u>	<u>DESCRIPTION OF FIELD AND COMMENTS</u>
R00	IND. Value = "Z"
R01	RES. Reserved, ASCII blank-filled
R02	= (Special Indicator)
R03	HGT LEVEL. Height level of rejected element stored in whole meters. If R04 = H, then R03 is recomputed height.
R04	REJ ELM IND. Rejected element indicator as follows: H = Height P = Pressure T = Temperature A = Wind Direction F = Wind Speed N = Density
R05	RES. Reserved, coded as 9.
R06	VALUE. Rejected element's value (-9999999 to +9999999). The value is stored in the same format as in the mandatory and additional data sections.

Note: The rejected fields for the ROCOB section contain original unchanged values for those fields deemed to be in error.